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REMARKS

Applicant has amended claim 1 to include the verb "is" that was inadvertently deleted by Applicant in the prior reply.

The examiner rejected Claims 1-3, 5-21, 23-32 under 35 U.S.C. 103(a), as being unpatentable over Mehovic (US 6,122,642A) and in view of Filepp et al. (US 200310167307 A1), hereinafter referred to as Mehovic and Filepp, respectively.

The examiner stated:

> As per claims 1, 5, 19, 23 and 30, Mehovic substantially teaches the claimed invention including an airline computerize reservation system ("CRS") to provide flight and seat availability information (Col. 2 lines 5-20), Mehovic also teaches at Fig. 4 a cache (Fig. 4, element 20) stores data propagated from the CRS 12 data, which is used to response to queries from client 26 (Col. 3 lines 54-58).
>
> The different between Mehovic's system and the claimed invention is that Mehovic uses different cache management algorithm. Mehovic synchronizes the cache 20 with the CRS by propagating data immediately after CRS 12 updates the data or at definable intervals of time (Col. 3 lines 59-65), and therefore does not teach proactively update the cache based on frequency of access to the cache as claimed. However, Filepp teaches an airline reservation system (page 4, [0052]) utilizing caches storage (Fig. 2, 302) wherein the objects in caches are proactively updated based on frequency of access to the objects in the caches (page 50, [0821]-[0823]). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Filepp's cache management algorithm with Mehovic's CRS system so that "only the latest version of the object will be provided to guarantee currency of information to the user" as noted by Filepp at page 50, [0821]. By factoring the frequency of updating of updating of the objects in order to determine whether cached objects are current, Mehovic's system would detect the fights with high frequency of access, which implies that the number of available seats are also changed more frequently, and update the flight data so that the availability information for that flight is updated and current, therefore prevent overbooking or assigning the same seat to multiple passengers.

Claim 1 is distinct over Mehovic taken separately or in combination with Fileep. Applicant contends that no combination of these references suggests proactively determining if a stored answer in the cache is stale, the stored answer corresponding to seat availability information ... with determining ... based on a criterion for seat availability information, which criterion is determined based on needs of a travel planning system ... .

According to the examiner Mehovic teaches an airline computerize reservation system ("CRS") to provide flight and seat availability information (Col. 2 lines 5-20). Claim 1 is

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directed to a methodolgy of updating a cache that holds answers to seat availability queries.
Conventionally, this problem is solved by making actual seat availability queries to an airline's
revenue mangement system. It is not known from Mehovic whether the CRS described by
Mehovic includes the RMS system or not. The examiner also states that Mehovic "teaches at
Fig. 4 a cache (Fig. 4, element 20) stores data propagated from the CRS 12 data, which is used to
response to queries from client 26 (Col. 3 lines 54-58)." However, Mehovic does not describe
element 20 in Fig. 4 as caching seat availability information for a seat on a mode of
transportation.

In any event, Mehovic is directed to a fundmentally different problem than that of
Applicant. Mehovic is teaches "to automate the migration of data structures from an airline TPF
based CRS processing environment and, in particular, the American Airlines' SABRE TPF based
CRS environment to a relational database management system (RDBMS) for transparent
retrieval and use by the end user." Mehovic is directed to a migration tool. After migtation,
Mehovic has a system, the RDBMS, that can be used in travel planning, but that system has no
relevance to claim 1.

The examiner recognizes at least one of the deficiencies in Mehovic's system is that
Mehovic uses different cache management algorithm. Mehovic describes to:

> A logic flow chart of the data propagation selection process 28 resident on
> the TPF based CRS 12 is shown in FIG. 2. The process comprises a series of steps
> for data propagation that occur immediately after the TPF based CRS 12 updates
> the data or at definable intervals of time, in which case data updates are saved in a
> log until the next propagation event.

Mehovic does not teach to proactively update the cache based on frequency of access to
the cache, but instead synchronizes the RDBMS with the CRS either immediately or at definable
intervals of time. The examiner relies on Filepp to teach "proactively update the cache based on
frequency of access to the cache as claimed."

Assuming *arguendo* that Filepp teaches the cache management scheme, Applicant
contends that there is no basis upon which to motivate this combination of references. The
examiner urges that the motivation is: "so that 'only the latest version of the object will be
provided to guarantee currency of information to the user' as noted by Filepp at page 50, [0821].

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Appellant contends that this motivation is illogical when viewed with Mehovic's system. Indeed if the desired outcome was to ensure that only the latest version of information in the TPF system of Mehovic was migrated to the RDBMS system of Mehovic, what better way to satisfy that than by migrating the data when the data in the TPF system changes, as Mehovic does, since it is the TPF system and not the RDBMS system that knows when updates are available.

The examiner also argues that: "By factoring the frequency of updating of the objects in order to determine whether cached objects are current, Mehovic's system would detect the fights with high frequency of access, which implies that the number of available seats are also changed more frequently, and update the flight data so that the availability information for that flight is updated and current ... .

However, this motivation also is illogical because Mehovic is dealing with a migration tool, where the frequency of changes in the TPF system are not based on current needs of the RDBMS system or the clients attached to the system, but instead at the rate that the TPF system updates the data. Moreover, the examiner has not shown how the combination of references deals with the feature of "sending an availability query to a source of seat availability." Clearly, Mehovic describes that the TPF system updates the RDBMS, but says nothing about the RDBMS system an availability query to a source of seat availability.

In Mehovic, the end user system is a client that presumably seeks travel planning such as, determining travel options, e.g., units of transportation coupled with fares or prices. However, that client represents many such clients all having different needs. It would appear illogical to update on the basis of the client's use, since that use is varied and intermittent. However, in Mehovic, it would also be illogical to update on the needs of the RDBMS itself, since the TPF migrates to the RDBMS all of the data structures that are in the TPF system. Thus, the only way that seems logical to update the RDBMS is the way that Mehovic describes: "as changes occur in the TPF" or "on a defined basis... using a log in the TPF to save changes," (of course at the cost that the RDBMS would occasionally have incomplete data). Nevertheless, Mehovic with Filepp is a proposed combination that destroys the intent purpose and function of Mehovic, the primary reference, and thus per se is not suggested

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However, Applicant contends that Filepp does not teach "wherein the objects in caches are proactively updated based on frequency of access to the objects in the caches (page 50, [0821]-[0823]).", as the examiner urges.   Filepp discloses in those paragraphs:

> [0821] When objects are requested from object storage facility 439, only the latest version of the object will be provided to guarantee currency of information to the user. Object storage facility 439 assures currency by requesting version verification from network 10 for those objects which are available locally and by requesting objects which are not locally available from delivery system 20 where currency is maintained.
> [0822] Version verification increases response time. Therefore, not all objects locally available are version checked each time they are requested. Typically, objects are checked only the first time they are requested during a user session. However, there are occasions, as for example in the case of objects relating to news applications, where currency is always checked to assure integrity of the information.
> [0823] The frequency with which the currency of objects is checked depends on factors such as the frequency of updating of the objects. For example, objects that are designated as ultrastable in a storage control parameter in the header of the object are never version checked unless a special version control object sent to the RS as part of logon indicates that all such objects must be version checked. Object storage facility 439 marks all object entries with such a stability category in all directories indicating that they must be version checked the next time they are requested.

Neither the object verification discussed in [0821-0822] in which when objects are requested from object storage facility 439, the latest version is provided to guarantee currency of information to the user nor the frequency of updating, as disclosed in [0823], suggests "determining being based on a criterion for seat availability information, which criterion is determined based on needs of a travel planning system that makes queries to the cache for obtaining the seat availability information."

In Filepp, the Object storage facility 439 assures currency by requesting version verification from network 10 for those objects which are available locally and by requesting objects that are not locally available from delivery system 20 where currency is maintained. However, these teachings have no relevance to the claimed feature of claim 1. Rather, Filepp teaches away from claim 1, because in Filepp each time an object is requested, Filepp teaches to request verification. Filepp also recognizes in [0822] that "Version verification increases response time."

In Filepp at [0823], Filepp also discusses that: "The frequency with which the currency of objects is checked depends on factors such as the frequency of updating of the objects."

However, this also is not relevant to the claimed feature, since the objects are updated based on their designation, e.g., ultrastable "never version checked unless a special version control object sent to the RS as part of logon indicates that all such objects must be version checked."; or "Object storage facility 439 marks all object entries with such a stability category in all directories indicating that they must be version checked the next time they are requested."

According, any combination of Filepp's cache management algorithm with Mehovic's CRS system is not suggested and such a purported combination would not provide the features of claim 1. Rather, the combination of Mehovic with Filepp destroys the intent, purpose and function of Mehovic as modified by Filepp thus teaches away from claim 1.

The examiner argues for claim 2, that Filepp teaches: "monitoring availability queries made to the cache by a travel planning system to determine which flights, sets of flights, the flights for a certain day, date, or market have a high demand for availability information" at pages 50-51, [0821]-[0827].

Paragraphs 821-823 were addressed above. Here the examiner uses Filepp's teachings of 0825] Stageable objects that are subject to frequent change or update; [0826] Cacheable objects that can be retained during the current user session, but cannot be retained between sessions, and [0827] Trashable objects that can be retained only while the user is in the context of the partitioned application in which the object was requested to meet the features of claim 2.

Again, the same rationales, lack of motivation to combine and that any purported combination fails to suggest the feature of claim 2, apply because again these teachings suggest updating based on the object type, but have no relevance to the claimed feature of claim 2. In addition, the examiner completely ignores the features in claim 2, as well as, the problem that claim 2 (and claim 1) address. Indeed, the examiner does not even make an attempt to show were the features of claim 2 are described or suggested in the cited reference.

For claim 3, the examiner relies on Mehovic for teaching: "scheduling a list of keys where the list of keys are identifiers of specific instances of transportation to update or add, and for each key on the list in the order given, submitting a query to the availability source; and storing the result in the cache, by updating an entry if present and adding an entry if not present in the cache." at Col. 6 line 40 to Col. 7 line 15."

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However, the cited passages are not relevant to the features of claim 3, but instead, discuss migration using the so called passenger name record (PNR). The cited passages not a mechanism of scheduling a list of keys where the list of keys are identifiers of specific instances of transportation to update or add. Nor does Mehovic teach to update each key on the list in the order given, or submitting a query to the availability source and storing the result in the cache, by updating an entry if present and adding an entry if not present in the cache.

Claim 5 calls for a cache manager that manages a quality level of entry information in the cache by proactively populating the cache to maintain a high quality level of entries of seat availability information ..., with the quality level ... determined by evaluating entries in the cache according to a criterion related to needs of a travel planning system ... and that sends an availability query to a source of seat availability information ... based on determining that the seat availability information in the cache was stale.

Mehovic does not teach any update protocol based on quality level as the examiner admits. Filepp et al. also fails to teach any update protocol based on quality level for analogous reasons discussed above and in addition, because Filepp teaches updating based on an object type. Filepp does not suggest "with the quality level ... determined by evaluating entries in the cache according to a criterion related to needs of a travel planning system ... and that sends an availability query to a source of seat availability information ..."

Claim 30 recites ... determining, which entries to add, delete, or update in the cache by monitoring and examining availability queries made to the cache by a travel planning system to determine which instances of transportation have a high demand for availability information, and proactively updating entries in the cache if an instance is determined to have a higher than average or higher than expected demand.

Mehovic in view of Filepp et al. neither describe nor suggest these features. Neither Mehovic nor Filepp et al. describe sending an actual availability query to a source of availability information. Mehovic in view of Filepp et al. does not suggest populating a cache based on monitoring and examining availability queries made to the cache by a travel planning system to determine which instances have a high demand for availability information and updating entries in the cache based on if an instance is determined to have a higher than average or higher than expected demand.

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The examiner rejected claims 4 and 22 under 35 U.S.C. 103(a) as being unpatentable over Mehovic and Filepp as applied to claims above, and further in view of Khosravi-Sichani (US 5,983,217 A), hereinafter "Khosravi".

These claims are also allowable, since Mehovic and Filepp do not suggest the features of the base claims and Khosravi fails to teach the features of these claims.

The examiner stated:

> As per claims 4, 22, Mehovic and Filepp teach the method of claims 1, 19 as discussed above. Mehovic and Filepp do not teach the step of processing query entry using round-robin algorithm as claimed. However, querying using round-robin is well know (sic) in the art, as exemplary by Khosravi. Khosravi teaches a method of querying replicate database using round-robin algorithm in order to "provide an even load sharing of queries" (Col. 1 lines 55-65). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Khosravi with Mehovic and Filepp's teaching because employing round-robin algorithm would ensure that all queries are processed equally and providing an even load sharing of queries.

Claim 4 does not merely claim a round robin technique, but recites a specific approach that uses scheduling multiple lists, by processing one entry from each list by round-robin polling through the lists in turn until one entry has been processed from each list. However, claim 4 also includes the features of returning to the first list to process the next entry, generating an entry for each entry on the list in the order given, by submitting a query to the availability source; and storing the result in the cache, by updating an entry if present and adding an entry if not present in the cache.

Khosravi teaches a technique for load balancing not a technique for determining if the stored answer is stale, as recited in claims 4 and 22.

Applicant's dependent claims add further distinct features to the invention as generally argued of record, and are at least allowable due to their dependency on allowable base claims.

Response to the examiner Comments

The examiner takes issue with Applicant's argument in the prior reply that: " Particularly, Mehovic does not teach "provid[ing] flight and seat availability information."

The examiner contends that:

> Mehovic teaches a method for migrating data from the SABRE computerized
> reservation system to a relational database management system (i.e, a cache) for
> retrieval and used by the end user. The SABRE system is well known in the art and
> has been used by travel agents since 1960s to retrieve flight information, seat
> availability and booking information. All basic features of the SABRE system
> should be inherent to a skill in the art and need not be explicitly recited. Therefore,
> it is unreasonable to state that the SABRE system does not provide flight and seat
> availability information, as argued by applicants. Mehovic teaches the detail of
> information stored in the relational database, which includes: Reservation, Segment,
> Passenger and ticket at Col. 6 lines 40-67 et seq.

Applicant responds that: "The concept of inherency is not applicable to the question of obviousness." *In re Sporman*, 363 F.2d 444, 150 USPQ 449 (CCPA 1965). To refer to an unexpected property or parameter as inherent begs the question of whether the unexpected property rebuts prima facie obviousness. Obviousness and inherency are entirely different questions; that which may be inherent is not necessarily known and, therefore, is an indication of unobviousness (*In re Sporman*, 363 F.2d 444, 449, 150 USPQ 449, 452 (CCPA 1965; see, also In re Naylor, 360 F.2d 765, 152 USPQ 106 (CCPA 1966); In re Adams, 356 F.2d 998, 148 USPQ 742 (CCPA 1966); and In re Shetty, 566 F.2d 81, 195 USPQ 753 (CCPA 1977)). Reference to an unexpected property as inherent, thus, begs the question of whether an unexpected property rebuts prima facie obviousness.

Applicant also notes that the examiner states that: "Therefore, it is unreasonable to state that the SABRE system does not provide flight and seat availability information, as argued by applicants. Mehovic teaches the detail of information stored in the relational database, which includes: Reservation, Segment, Passenger and ticket at Col. 6 lines 40-67 et seq."

The examiner misunderstood Applicant's prior argument, although Applicant did state: "However, this excerpt from Mehovic reproduced above, clearly shows that no such teaching exists in Mehovic." In answer to the examiner's statement: "Mehovic teaches to provide flight and seat availability information at (Col. 2 lines 5-20).", Applicant did not intend to mean that Mehovic did not teach flight information, but Applicant clearly stated that Mehovic did not teach "flight information and seat availability information," because Mehovic fails to teach "seat availability information."

However, even the examiner vitiates his rejection, since he clearly acknowledges that: "Mehovic teaches the detail of information stored in the relational database, which includes: Reservation, Segment, Passenger and ticket at Col. 6 lines 40-67 et seq." However, neither in

Mehovic nor in the examiner's reasoning does either show where Mehovic teaches "seat availability" information.

Applicant thanks the examiner for acknowledging that he views Mehovic's relational database to act as a cache to provide data to client 26. Applicant has already addressed this argument above.

The examiner responds to applicants' argument that:

> Mehovic does not proactively determine if the cache are stale" by ... the propagation occur immediately after the system 12 updates the data, or at definable intervals of time. It is apparent that after the data in the SABRE system is updated, the data stored in the relational database 24 is stale. Mehovic therefore monitors the data in the SABRE system 12 to determine if the cache is stale. As soon as the data in the SABRE system 12 is updated, the updated data is propagated to the relational database in order to keep the cache current, or in sync with the SABRE system (Col. 3 lines 59-65). Mehovic's cache update method is "proactively" because the data in the cache is updated before it is used to provide information to the client 26.

Applicant contends that this reasoning amounts to an unstated and unmotivated modification of Mehovic, since earlier the examiner admitted that Mehovic updates based on a schedule either immediately or at predefined intervals. This argument contradicts the examiner's reasoning above.

The examiner takes issue with Applicant's argument: "that Mehovic does not determine staleness based on needs of travel planning system that makes queries to the cache, nor sending an availability query to a source of seat availability information based on determining that the answer was stale." The examiner appears to address Applicant's remarks that Mehovic teaches this, but in the rejection the examiner admits that Mehovic fails to teach this and relies on Filepp.

The examiner takes issue with Applicant "not explain[ing] what the criterion is and how they are different. Applicant has furnished many examples of criterion in the specification and unless the examiner produces a reference that teaches update based on needs of a travel planning system based on criterion, Applicant need not further limit the claims.

Applicant's arguments are addressed to show that combination of references fail to suggest the claimed invention in accordance with *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091,231 USPQ 375 (Fed. Cir.1986), cited by the examiner.

The art cited but not applied is seen as neither describing nor suggesting applicant's invention whether taken separately or in combination with the art of record.

Accordingly, in view of the above amendments and remarks, the length of prosecution, and a prior indication of allowable subject matter, it is submitted that the case is now in condition for allowance and such action is respectfully requested. Please apply any other charges or credits to deposit account 06-1050.
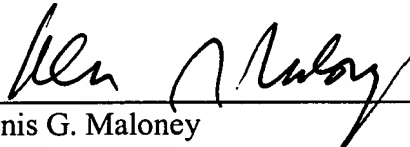
This Reply is accompanied by a Notice of Appeal.

Enclosed is a **$120** check for the Petition for Extension of Time fee. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: 3/24/06

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